EFFECTS OF NDL-PCB ON PORCINE MACROPHAGES: PRELIMINARY RESULTS

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Introduction

Polychlorinated biphenyls (PCBs) are persistent organic pollutants (POPs) causing adverse effects on both humans and animals (Marinkovic et al., 2010; White et al., 2009). Immune system is an important target organ for many environmental contaminants. Macrophages constitute an important component of the immune system of humans and animals, in fact, they are responsible for triggering innate immune responses and host defense (Flannagan et al., 2009; Jaiswal et al., 2010). Although it is known that various environmental contamination, including dioxins and PCBs, may affect the immune system, only few studies have been carried out to date about the effects of these xenobiotics in macrophages; while, at our knowledge, no study has been performed using porcine macrophages. The aim of the current study was to assess the immunomodulatory effects of certain non dioxin like PCBs (PCB 138; PCB 153 and PCB 180) using porcine macrophage 3D4/31 cell line. We evaluated not only the effects induced by the individual congeners but also those deriving from mixtures of more contaminants, in consideration of the fact that co-contamination of the same substrate is common in natural conditions and the effects of simultaneous exposure to multiple contaminants are still little investigated.

Methods

3D4/31 cells were maintained in RPMI 1640 medium supplemented with 10% (v/v) Fetal Bovine Serum (FBS), 2 mM L-glutamine, 1% NEAA, 1% Na piruvate and antibiotics at 37 °C in humidified atmosphere with 5% CO_2. Cells were seeded in 96 well-plates at $5 \cdot 10^3$cells per well and incubated for 24, 48 and 72 h in absence of and in presence of PCB 138, PCB 153 and PCB 180 (1-50 µM). Numbers of viable cells were quantified using the MTT assay. Cell population growth inhibition was also randomly verified by cytometric counting (trypan blue exclusion). The effects on apoptosis induction and cell cycle progression were analyzed using PI staining by flow cytometry.

Results and Discussion

The results of the current study showed that ndl-PCBs reduced significantly cell viability only at the highest concentration (50 µM); such effect was not linked to apoptosis induction or cell cycle arrest. The contemporary presence of more than one contaminant (differently combined) did not induce any enhancement of effects on 3D4/31 cell line. The results of the current study highlight the need to continue the evaluation of toxic properties of ndl-PCBs, which represent a less studied PBCs; such studies could provide useful information in particular in term of risk assessment.

References

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